STATION 1

Correct order of assembly $(6 \times 1) =$	**6 marks**
Correct labeling $(6 \times \frac{1}{2}) =$	**3 marks**
Proportionality $(1 \times 1) =$	**1 mark**
	(10 marks)

STATION 3

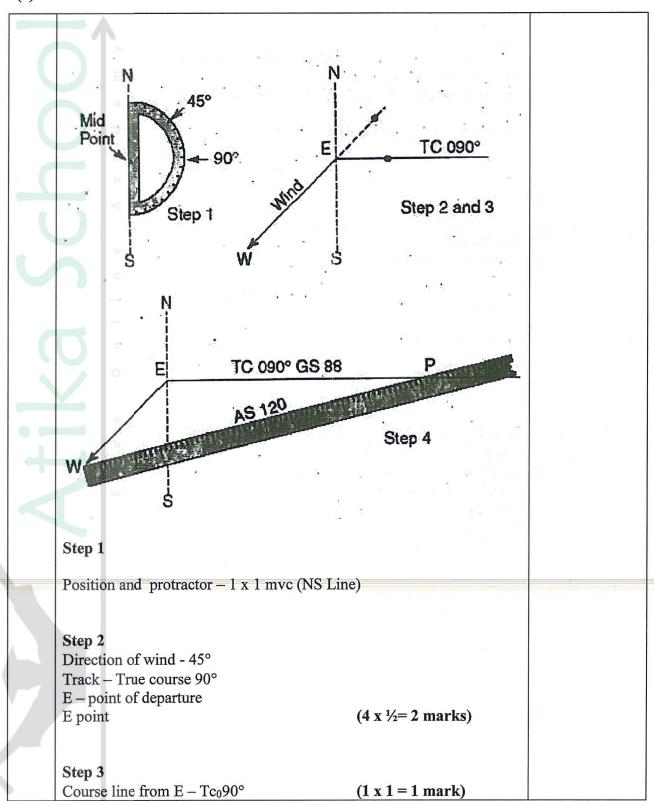|			
3 (a)	(i)	Check and record the block top surface for war page Reading – **Sample data** Warpage condition – **Sample date**	**(1 mark)** **(0.5 marks)**
	(ii)	The tool used, Straight edge Feeler gauge 2 x 0.5 = 1	**(1 mark)**
	(iii)	Make sure that the surface is free from gasket chips and other foreign matters.	**(0.5 marks)**
(b)	(i)	Check and record the condition of the cylinder walls on the cylinder block provided. Condition – scratched and worn.	**(1 mark)**
	(ii)	In view of results in b (i) give recommendations. Recommendation – Scratched and solution is to rebore or replace.	**(1 mark)**
(c)	(i)	Measure and record on cylinder labelled W at point x, y and z the internal diameter. Point x – Sample Data Point y – Sample Data Point z – Sample Data (3 x 1= 3 marks)	**(3 marks)**

	(ii)	Determine from C (i) the bore and cylindricity Bore – Sample Data Cylindricity – Sample Data	**(1 mark)**
	(iii)	In view of results in C (i) and (ii) give recommendations. Recommendations – Correct the cylinder to an oversize and replace the piston rings if worn beyond 0.001 mm limit.	**(1 mark)**

STATION 4

Item	Identification	Application	
1.	Cross union	Forms a four way junction.	
2.	Reducing union	Enables pipe of different diameter to be connected.	
3.	Straight bulkhead union	Adoption of another threaded nut to attach the union firmly to the wall or bulkhead.	
4.	Nipple	Used to correct pipes and units of equal diameter. **(8 x ½ = 4 marks)**	**(4 marks)**
(b)	(i) Size of paper 5 – rigid pipe by external diameter – Sample data (ii) Size of pipe 6 – Internal diameter …….Sample data		
(c)	Defects on 5 : - Bent - Threads damaged Defects on 6 - Porosity - Broken strands		
(d)	Check on pipe 6 - Ensure no bulging of ingress of dirt by passing on ball through pipe. - Externally ensure the damage or signs of broken stands. **(2 x ½=1 mark)**		**(1 mark)**
(e)	Application Pipe 5 – fuel system Pipe 6 – hydraulic system **(2 x ½=1 mark)**		**(1 mark)**

(b)	(i)	The ball will suspend upright by the airflow	
	(ii)	The ball will stay suspended in the airstream.	
	(iii)	The ball will stay suspended in the airstream slightly further away from the Nozzle.	
	(iv)	Reasons - The pressure acting upon the ball tends to make it suspended in the airstream when airstream pressure increases. - The fast moving airstream lessens the air pressure on the portion of the ball remaining in the airstream. - The force of gravity is overcome which results in the ball remaining suspended according to pressure variations. **(6 x 1 = 6 marks)**	**(6 marks)**
(c)	(i)	Generation of lift over an air foil in relationship to the relative airflow.	
	(ii)	Factors - Change in air density - Change in temperature **(3 x 1 = 3 marks)**	**(3 marks)**

(a)

Step 1

Position and protractor – 1 x 1 mvc (NS Line)

Step 2
Direction of wind - 45°
Track – True course 90°
E – point of departure
E point   (4 x ½= 2 marks)

Step 3
Course line from E – Tc₀90°   (1 x 1 = 1 mark)

	Step 4		

	(i) – Wind arrow **E** at 45° downward
	(ii) – Identify **W** – wind line
	    - Determine scale for use with arrow and **W** and 120 knots
	     dot interception of true course line.
	(iii) – Draw Airspeed (As 120) with point **P** at intercept (Aircraft
	     position P)
	(iv) Ground speed on (TC 090° GS 88) knots
	
	                             (4 x 1 = 4 marks)		

(b)	(i) True heading 0.76° (ii) Wind correction angle 14° **(2 x 1 = 2 marks)**		

STATION 7

(a)	(i) Observation : Ball remains floating but water level rises
	     slightly.
	(ii) Reason : Ball displaces its own volume (weight)
	(iii) Principle : Up thrust (floatation)
	(iv) Application :
	     1. Carburetor
	     2. Fuel tanks quantity
	
	                    (4 x 1 = 4 marks)
			(4 marks)

(c)	(i) Elliptical – Low speed (ii) Delta – Very high speed (iii) Sweep back – High speed (iv) Rectangular – Low speed **(4 x ½ = 2 marks)**		**(2 marks)**

STATION 8

(a)	(i) Gyroscopic precision (ii) Navigation **(2 x 0.5 = 1 mark)**		**(1 mark)**
(b)	(i) Observation : The bourdon tube tends to straighten to move the gear mechanism. (ii) Reason : The outside part of bourdon has a bigger service, area and thus under some pressure, the bourdon tube tends to straighten . (iii) Principle : Area differential. (iv) Application : System pressure indication **(4 x 1 = 4 marks)**		**(4 marks)**
(c)	(i) Observation : The bellows expand and contract, moving the gear mechanism. (ii) Reason : The bellow expand under pressure but remains stationery under static pressure condition. (iii) Principle – Pressure differential (iv) Application – Airspeed indiction **(4 x 1 = 4 marks)**		**(4 marks)**
(d)	Comparison ……A requires more pressure to move the gear assembly than B.		**(1 mark)**

STATION 9

Test	Material T	Material V
Colour	Transparent/colourless	Tint background viewed from edge
Breaking	Snaps with clean edge	Tears with ragged edge.
Cutting	Easily cut with standard tools	Cuts easily with scissors
Burning	Burns slowly with clear smokeless flame	Smoky flame and melts
Bending	Brittle springy and only bends slightly	Easily bend and flexible

10 x 1 = 10 marks